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Lee

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(54) **LIQUID CRYSTAL DISPLAY DEVICE AND A METHOD FOR MANUFACTURING A GROUNDING DEVICE**

JP 406082803 A * 3/1994
JP 200258789 A * 9/2000

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* cited by examiner

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(*) **Notice:** Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

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(58) **Field of Search** 349/58, 62, 149,
349/150, 152

(56) **References Cited**

FOREIGN PATENT DOCUMENTS

JP 40371921 A * 12/1992

(57) **ABSTRACT**

An LCD device in which a plurality of grounding protrusions are formed in a region not having a signal transmission pattern among the bottom surface of a printed circuit board in contact with a bottom chassis so as to increase a contact area between the printed circuit board and the bottom chassis, to thereby prevent a damage caused by an electro-magnetic wave and error of devices.

5 Claims, 6 Drawing Sheets

